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ABSTRACT

Changes in the future role of occupational instructors which will be brought about by advances in educational technology are illustrated by the description of the Advanced Instructional System (AIS), a complex approach to occupational training which permits large-scale application of individualized instruction through the use of computer-assisted and computer-managed instruction. Currently being tested at Lowry Air Force Base, Colorado, the system does the following: (1) maintains a file of student characteristics, aptitude scores, indexes of reading ability, educational background, and other selected data; (2) selects the best media mix for each student and presents the course material; (3) records student responses and maintains a running progress record; (4) develops and administers lesson prescriptions, tests, and remedial diagnostic training; (5) predicts the student completion date; and (6) evaluates and revises the course materials. The effect of the AIS on the instructor is to change his role from lecturer/testor to training guidance counselor and advisor to students, a role demanding full cognizance of all areas covered by the training program and the technical capabilities required to produce high-quality revisions to the computer-managed training materials as course content changes due to improvements or technological advances. (RT)

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NEW ROLES FOR

OCCUPATIONAL INSTRUCTORS

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MAY 26, 1977

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NEW ROLES FOR OFFICE OCCUPATION INSTRUCTORS

The recent February issue of the Phi Delta Kappan focused on the question "Will Technology Revolutionize Education?" Nineteen prominent educators commented on an address by William C. Norris entitled "Via Technology to a New Era in Education." Comments on the article ranged from strong support to "I can see no reason for publishing the Norris article, let alone commenting on it."[1]

My attempts today at "crystal balling it" will probably prompt similar debate--as it rightfully should! For, then I will at least have stimulated each of you to collectively utilize the enormous talent and experience gathered for this workshop to exchange your ideas in planning more effectively for our future--specifically as it might impact on you, in office occupations, in our third century.

Whether your personal philosophy leans to back to basics or toward there must be a better way, I think we can all agree that the instructor will be the key instrument in any significant change. Instructors in the future, as well as those of today, face amounts to an over-choice. Every day we are bombarded by more and more information through the ever-increasing sophisticated forms of mass media. This bombardment of knowledge is so great that G. H. Voegel in his article in the '76 spring issue of Community College Frontiers stated that "the youth of today interrupt their education to go to school ..."[2]

Over-choice of information is particularly critical for teachers of technical and occupational courses. The rapid advancement of technology in this century has been one of the great miracles in man's modern history and this advancement will surely expand at an ever-increasing rate into our nation's third century. This may partially explain why the average adult American, according to a recent Department of Labor statistic, has seven jobs and three careers in a lifetime.[3]

How will the role of the occupational or technical instructor of the third century change, or will he or she also become part of those Department of Labor statistics?

Arthur M. Cohen, Director of ERIC Clearinghouse for Junior Colleges, has stated that "prognostications are influenced by wishes more than by genuine appraisal of trends."[4] My crystal ball is probably no more accurate than yours. But, in attempting to focus more on "trends" rather than wishes in preparing my remarks, I consulted Air Training Command's (ATC) 15 Year Plan: 1976-1991. As the Air Force's principle user of training technologies, ATC conducts one of the largest technical training programs in the world. In attempting to cut the cost of training, we have adopted the theory that there must be a better way; or at least alternative, to improving methods of instruction. In reviewing ATC's look into the training future, perhaps we will be able to more accurately predict the role of the occupational instructor in our third century. Our forecast will be influenced by the following items extracted from the 15 Year Plan:

ITEM - Results of training research and applications of instructional innovations provide great potential for improving training efficiency and effectiveness.

ITEM - Research projects will assess the use of computers to manage the flow of students through evaluation checkpoints and to administer objective tests.

ITEM - Trend toward greater use of individualized instruction has increased the need for training media to supplement and extend the capabilities of instructors.

ITEM - Self-paced, individualized instruction . . . will be use in all applicable situations.

ITEM - A phenomenon of this age of almost instant mass communications media is a marked inability of students to read as effectively at given educational levels as those of past generations. A research program is therefore needed to address the literacy problem.

ITEM - An evaluation analysis method built upon currently available computer programs for more comprehensive and earlier identification of course deficiencies is required.[5]

Computer applications to training are referred to repeatedly in the 15 Year Plan. They are considered as teaching

aids, as computer-assisted instruction, as training manager tools, and in computer-managed instruction. One proposal having the broadest impact on the future role of the instructor is typified by an advanced technology training system currently being tested at Lowry AFB, Denver, Colorado. This program, called the "Advanced Instructional System," is a prototype computer-based arrangement for the administration and management of individualized technical training. The system is computer-directed, based upon the following concepts:

(1) Since students learn and respond at different rates and to different media, a self-paced, individualized approach to instruction is utilized.

(2) That the best way to realize savings is through improved resource utilization such as student time, instructional staff and all other training resources.

(3) The system is designed to effectively manage the activities of thousands of self-paced students concurrently.

The Advanced Instructional System (AIS) is a complex approach to training which permits large-scale application of individualized instruction through the use of computer-assisted and computer-managed instruction. Computer-assisted and computer-managed instructional systems have historically

progressed with somewhat separate lives of their own and a clear idea of the differences between the two is required if we are to understand the total system. Computer-assisted instruction, the oldest computer application to training, deals with the interaction between a student and a computer through a terminal. The computer feeds training material to the student and the student responds. Based on these responses, the computer gives the student more new material to study or retraces some ground if the student is having trouble. Computer-managed instruction deals with the management of training materials, record keeping for each student, and the scheduling and clerical aspects of training. As a general rule, the student does not come into direct contact with the computer-managed aspects of his or her training.

What could you and I expect from this Advanced Instruction System? This system will maintain a file of student characteristics, aptitude scores, indexes of reading ability, educational background, and any information the instructor feeds into the computer. Based on this information, the AIS selects the best media mix for each student and presents the course material to the student. Those who read and comprehend well are given printed materials. Students who learn best from hands-on performance are trained as much as possible in that fashion. In most cases, however, a mixture of methods are used for all students. In short, the training process is tailored to each

student's needs as much as possible--individualized instruction.

The AIS computer also records each student's responses and maintains a running record of his or her progress through the course of instruction. As a student completes each step of training, the computer develops a prescription regarding what should be done next. These lesson prescriptions are personalized for each student. The computer sequences and presents the instructional materials on an as-needed basis, or more precisely, based on the student's progress, capabilities, learning style, and readiness-to-proceed. How does the computer know that the student is ready to proceed? It determines readiness through the administration of tests. The tests are not being presented because it is test day for the class, but because an individual student has completed the necessary step or steps in the training program. This can happen at any time. The computer scores the test and determines pass or fail. If the student fails, the test results are used to automatically produce a diagnostic plan for remedial training. And, it also presents the required remedial training.

An extremely important objective of individualized, or self-paced, instruction is the prediction of when a student will graduate. The AIS system continually predicts the graduation date by observing the student's progress. As each student progresses further and further through the course, the computer

has more data to work with and prediction of the completion date becomes more and more accurate.

Finally, evaluation and revision of the course material is based on input from the student testing process when weaknesses in course materials are indicated. Revisions are also made when technological improvements in hardware or new hardware require changes in training.

What does the instructor do in a course which is operated under AIS? His or her role changes from lecturer, test giver, test corrector, and giver of grades to one of acting as a training guidance counselor and advisor to students in this new role. The instructor helps students utilize the instructional media and materials available to them. This means, of course, that the instructor must be fully cognizant of all areas covered by the training program, since the students will be at various stages of progress at all times. There is an increased and continuing challenge for the instructor. In addition, he or she must have the technical capabilities required to produce high-quality revisions to complex computer-managed training materials as the course content changes due to improvements or technological advances. Thus, rather than being relegated to the boneyard, instructors will, if anything, be faced with even greater challenges in their role within AIS.

At the 1976 annual meeting of the American Association of Community and Junior Colleges, K. Patricia Cross

predicted that "by the 1980s there will be more centralization of course design and more individualization of student instruction, and it won't cost any more in terms of either money or faculty satisfaction . . ."[6] I doubt that she was thinking specifically of AIS when she made her prediction. However, I am sure that we would both agree that these changes in the roles of the instructor will require a massive retraining of today's occupational instructors.

Within Air Training Command's 15 year forecast is a definitive plan to enable both the new and the old technical instructor force to keep pace with the changes. In part, this objective is to provide "Follow-on professional and technical training that must be available at all times to keep the technical instructor updated in all aspects of the whole training situation. Learning center concepts with modular scheduling and computer-assisted instruction will play an important role in our training environment for the years ahead."[7]

The technical or occupational instructor then, in our third century, will be one whose role will have been greatly altered. But, with adequate staff development and retraining programs, the instructor will continue to be the key in effectively causing learning--but augmented by advancements in technology as we enter into our nation's third century.

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